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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,213	09/03/2003	Masahiko Imai	025720-00011	2749

7590 10/12/2005

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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/653,213	Applicant(s) IMAI ET AL.	
	Examiner Thomas M. Dougherty	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 8,9 and 11-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7 and 10 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>903, 605</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. (US 6,236,141). Sato et al. show (fig. 14) a surface acoustic wave device comprising: a piezoelectric substrate (11) on which resonators having comb-like electrodes (13) are formed; and a silicon substrate (12, see col. 14 at ll. 5-11) that is directly bonded (see ABSTRACT) to the piezoelectric substrate (11) and is less expansive (see discussion at col. 14, lines 5-11) than the piezoelectric substrate (11), a cavity (14) being formed in the silicon substrate (12) and being located below at least one of the resonators.

The cavity (14) is formed in the silicon substrate (12) and is located below only an area that includes the comb-like electrodes (13).

The piezoelectric substrate (11) has a rough surface that is exposed through the cavity (14). See discussion at col. 14, ll. 15-27.

The device further comprises an acoustic absorption member provided on a surface portion of the piezoelectric substrate (11) exposed through the cavity (14). See the discussion at col. 14, lines 31-34.

The piezoelectric substrate (11) is made of one of lithium tantalite and lithium niobate. See col. 5, line 18.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 6,236,141) in view of Seki et al. (US 5,506,552). Given the invention of Sato et al. as noted above, Sato et al. do not show reflector electrodes. Sato et al. also do not show electrode pads provided on their piezoelectric substrate and electrically coupled to the resonators.

Seki et al. show (fig. 2) a surface acoustic wave device comprising: a piezoelectric substrate (see col. 1, line 34) on which resonators having comb-like electrodes (not specifically numbered) are formed.

Seki et al. show reflector electrodes (e.g. 23a) close to the comb-like electrodes thereof.

Seki et al. also show electrode pads (24a, 25a) provided on the piezoelectric substrate and electrically coupled to the resonators.

Seki et al. do not show a silicon substrate that is directly bonded to the piezoelectric substrate, or a cavity formed in a silicon substrate.

It would have been obvious to employ the reflector structure of Seki et al. in the piezoelectric device of Sato et al. at the time of the Sato et al. invention in order to

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control undesirable waves that may be generated when the structure is used.

Additionally, such a structure "makes possible the advantage of providing a ladder-type SAW filter with large stop band rejection and wide bandwidth". See col. 3, ll. 6-8.

It would have been obvious to employ the electrode pad structure of Seki et al. in the piezoelectric device of Sato et al. at the time of the Sato et al. invention in order to provide a means to get electrical signals to the resonators.

Allowable Subject Matter

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

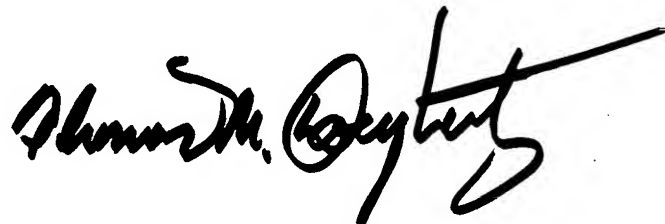
The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or fairly suggest a plurality of cavities in a silicon substrate which are located only below some comb-like electrodes which comprise resonator components in a surface acoustic wave device.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art reads on some aspects of the claimed invention.

tmd
tmd

September 15, 2005



**TOM DOUGHERTY
PRIMARY EXAMINER**